Egg Plant Approval

Sources

- Appendix E, Mil-Std-3006
- American Egg Board website
  - http://www.aeb.org

Background

- Eggs laid in varying conditions
  - Free-range/Nest-run
  - Cage confinement
- Harvest methods
  - Hand-picked
  - Conveyors

Average large house

Raised pen refuse

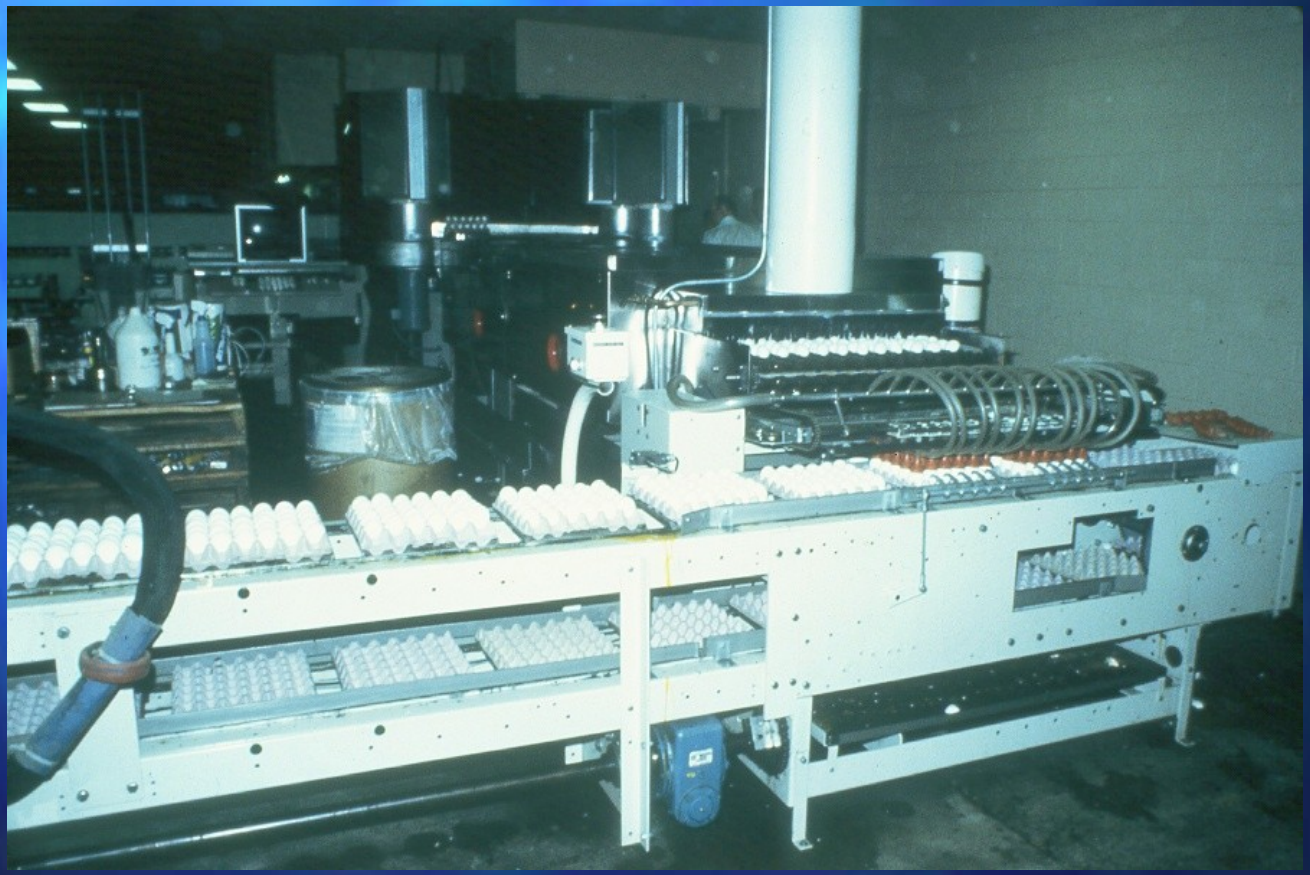
“Free run” system

State of the art

Hand Picking

Automated packaging

Full automation

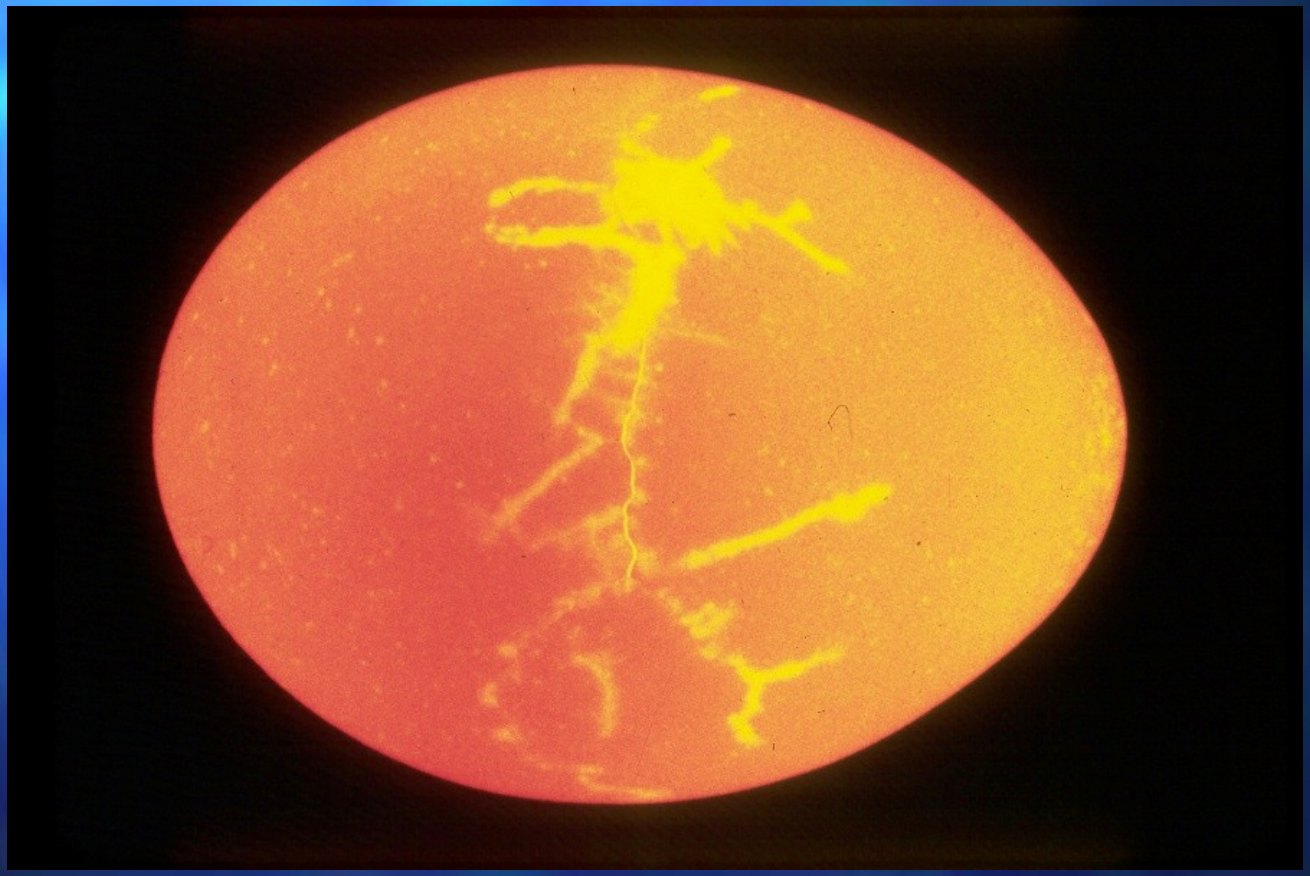


Plastic containers

Salmonella enteritidis

- Ovarian (vertical) transmission occurs rarely and in low #'s
- Survival and growth variable
- Check eggs (cracked) up to 20X more likely contaminated
- SE prevalence in POSITIVE flocks in US is 1/20,000 eggs

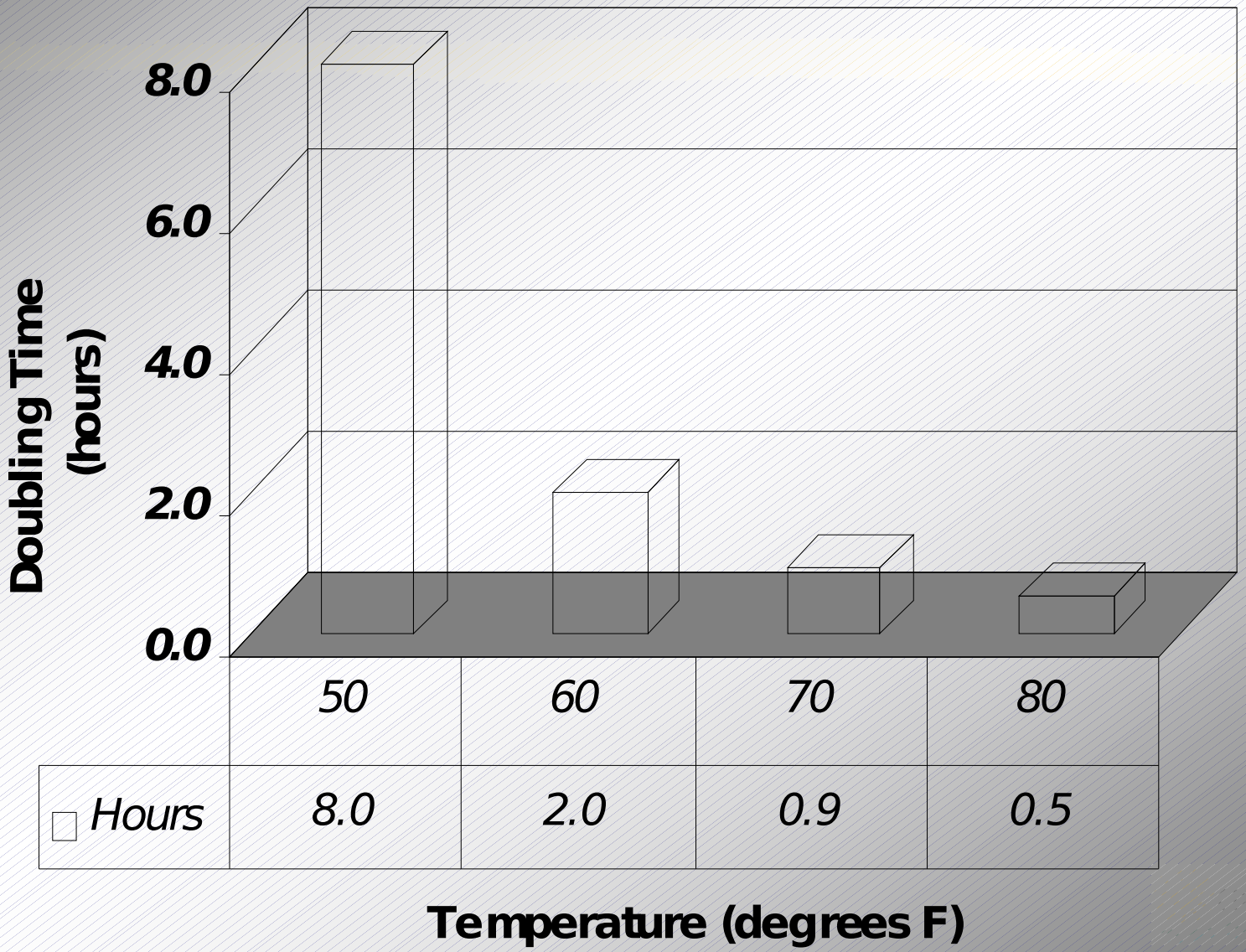
Check egg being candled



SE

- Penetration capability of shell by SE unknown
- Shell integrity a factor (porous)
- Carried by rodents
- Time and temperature critical for growth

Salmonella Doubling Rate



Worker Hygiene

- 39% of eggs in Western U.S. are gathered by hand (58% of farm sites)
- Average E. coli and Salmonella counts on hands decreased from 100,000/ml to 5000/ml following hand-washing (de Wit,1983)
- 41% of samples from poultry slaughter workers' hands were positive for Salmonella (de Wit,1983)
- Workers are a part of SE ecology

Current US Inspection

- USDA grades eggs primarily based on size and quality (consistency) of the contents
- US has various egg quality efforts designed to lower SE rate
  - On-farm HACCP
  - Biosecurity
  - GAPs for processing

Inspection Considerations

- Facility cleanliness
- Adequate lighting controls for candling/grading
- Adequate refrigeration

Inspection Considerations

- **Excess moisture**
- **Odorous oil**
- **Heat treating contaminated oil**

Inspection Considerations

- Washing/disinfection of processing equipment
- Wash temperature
- Replacement water

Inspection Considerations

- Iron content of water supply
- Washing and drying
- Sanitizer rinse
- Minimize heat exposure

Preparation

- Most outbreaks due to prep failure
- Food handlers must wash hands/equipment
- Do not pool eggs in large containers
- Cook thoroughly

Cooking

- Whole eggs: until white is completely coagulated and firm and yolk beginning to thicken
- Egg white coagulates at 144 -149F
- Yolk hardens between 149 - 158F
- No liquid visible in scrambled eggs
- No runny yolks

Procurement tips

- Fresher is better
  - 24-48 hrs to chill per US GAPs
  - No such standard in Japan, Europe
- 45F ASAP
- Consider Russian eggs
  - Novisibirsk produces safe and wholesome eggs

Procurement tips

- No cracked eggs, QA issue
- Clean transport containers
- Cage raised birds preferable

Questions?